AN

ESSAY

ON THE

DISEASES OF THE EXCRETING PARTS

OF THE

LACHRYMAL ORGANS.

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BY

WILLIAM MAC KENZIE,

MEMBER OF THE ROYAL COLLEGE OF SURGEONS,
OF THE MEDICAL AND CHIRURGICAL SOCIETY OF LONDON,
AND LECTURER ON THE ANATOMY AND SURGERY OF THE EYE.

LONDON:

PRINTED FOR ANDERSON AND CHASE,
40, WEST SMITHFIELD.

SOLD ALSO BY BURGESS AND HILL, GREAT WINDMILL STREET, HAYMARKET;
A. BLACK, EDINBURGH; W. TURNBULL, GLASGOW; AND HODGES
AND M'ARTHUR, DUBLIN.

1819.

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TO

GEORGE JOSEPH BEER, M.D.

PROFESSOR OF PRACTICAL OPHTHALMOLOGY

IN THE UNIVERSITY OF VIENNA,

THIS ESSAY,

MOST OF WHICH HAS BEEN DRAWN FROM HIS PUBLIC AND PRIVATE INSTRUCTIONS,

AND FROM HIS WRITINGS,

IS INSCRIBED,

WITH MUCH RESPECT AND GRATITUDE,

BY

WILLIAM MAC KENZIE.

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INTRODUCTION.

THE following is the first of a series of Essays upon the principal Diseases of the Eye, in which the author proposes to present to the reader an abstract of the most valuable works which have lately appeared abroad, and especially in Germany, upon that subject, together with such observations as reflection upon what he has seen in practice may suggest.

The ground-work of the arrangement of the Diseases of the Excreting Parts of the Lachrymal Organs followed in the present Essay, will be found in the work of the late Professor Schmidt, *Ueber die Krankheiten des Thraenenorgans*, and in the *Leitfaden* of Professor Beer. From these works also much of the following descriptions of these diseases has been taken. In what regards the practice, Professor Beer has in general been followed. Yet the author of the present Essay has not hesitated to differ

in a variety of points, from the opinions of these celebrated men.

The diseases which form the subject of the last ten chapters of this Essay, have been confounded by the greater number of authors under the name of fistula lachrymalis. In consequence of not distinguishing these different diseases from one another, it has been made the great object to discover some single successful method of curing them all. Now, there is no one method of treatment by which this can been accomplished; and hence it is that the several remedies which have been proposed, being eminently successful in one or other of these diseases, but not at all adapted to the rest, have at different times been held in such various degrees of estimation.

He is ever likely to be the most successful in his practice, who knows best how to form a true diagnosis. His discriminating eye seizes a number of minute yet important particulars, confounded or even entirely overlooked by careless and superficial observers, who are continually aspiring by some one general method to cure a

variety of diseases, the specific differences of which they have never condescended to study. *What operation do you practise for cataract? How do you cure fistula lachrymalis?*—are specimens of the questions which are in the mouths of such men. Yet there is no operative nostrum, by which all the varieties of cataract can be cured; nor any single method of treatment, suited to all the diseases of the excreting lachrymal organs.

Were we to set out indeed with a postulate that all these diseases have their origin in an obstruction of the nasal duct, as many writers upon this subject have done, we should naturally arrive at the conclusion that a successful method of removing such obstruction was the great desideratum. Let us take a different course. Coming to the subject, as it is trusted the reader does, with a knowledge of the anatomy and physiology of the parts, and knowing what are the diseases to which other parts of similar structure are liable; let us examine carefully the course, and the several terminations of the diseases in question, and seek the appropriate remedies for each.

The author has reason to believe, that the subject now treated of, has of late been rather neglected in this country, and that it is even not a little misunderstood. Ask many a surgeon what he thinks of fistula lachrymalis, and he will probably answer that it is a very perplexing disease—that he has seen it cured, indeed, in almost all kinds of ways, with probes, injections, styles, tubes, poultices, compression, by operation, and without operation, and yet, that with all these means of cure, this complaint is frequently found extremely stubborn. Without pretending to blame the practice of his superiors, the author may mention that he has seen the probes and injections of Anel used, when, according to the pathology to be delivered in the following pages, their employment must have been hurtful, or at least ineffectual; that he has frequently seen the lachrymal sac laid open, in cases which by no means appeared to call for any such operation; that he has witnessed the introduction of styles and tubes into the nasal duct, when this canal was obstructed merely by the passing tumefaction of its mucous membrane from inflammation; and that he has seen the os unguis

perforated, when there did not appear to be the slightest doubt of restoring the whole excretory apparatus of the tears, if recourse had been had to gentler remedies. He is not without hope, therefore, that the perusal of this Essay may be useful to those who are yet engaged in their preparatory studies, and to the younger part of the profession.

If an apology be necessary for any part of the nosological nomenclature used in the following Essay, it must be for the term *Mucocele*, by which the Author has ventured to designate an important disease, which was apt to be misunderstood when described under the name of varix or of hydrops. Some improvement in the nomenclature of lachrymal diseases has long been necessary, as may be judged from the following remark of Mr. Pott: "As the state and circumstances of this disease are really various, and differ very essentially from each other, the general custom of calling them all by the one name of fistula lachrymalis is absurd."

16, Newman Street, Oxford Street,
12th September, 1818.

CHAPTER I.

Of Wounds of the Lachrymal Canals.

If the canals which lead from the puncta lachrymalia to the lachrymal sac are wounded, the important question is, how far the eyelids are likely to be distorted, and the integrity of either of the canals to be destroyed, by the cicatrice which must follow, or by the suppurative inflammation which in every case is to be dreaded. When the wound has been occasioned by a clean cutting instrument, we may hope for a cure, without either distortion of the eyelids or permanent interruption of the functions of the canals. When the part is torn or bruised, it will probably be completely destroyed by the consequent suppuration; and if both canals are included in the injury, an irremediable stillicidium, or discharge of tears and mucus from the nasal angle of the eye, is the unavoidable consequence.

In lacerated wounds then, our prognosis must be extremely dubious. Yet even these

are sometimes happily cured. Professor Schmidt relates the case of a person who in a game at blind-man's buff, was laid hold of by the finger of one of the party, exactly in the nasal angle of the eye, and had the under eyelid torn away to the length of half an inch from the upper. Mohrenheim, who happened to be in the company, pronounced an unfavourable prognosis; but by the care of Professor Schmidt the case was cured in eight days, without the slightest stillicidium or ectropium.

The indications in cases of wounds of the canals, are, to bring the separated parts into apposition, and then to keep them so. The former is easier, and the latter more difficult, than might be supposed.

The mechanism of the eyelids, when they are opened widely, effects the former indication; but the instant that the eyelids are shut, the divided ends of the canal separate from each other. We are obliged therefore to apply such means while the patient keeps his eyelids separate, as may insure the exact apposition of the edges of the wound during sleep.

It must be evident that we have not sufficient space in this case for the application of

sutures; and even if we had, the introduction of a suture near the edge of the eyelid, where the canal itself is placed, would be little else than risking a new wound, in addition to that which we were called to remedy. We have then to trust principally to the aid of adhesive plasters, and to the co-operation of the patient in shutting his eye-lids as seldom as possible during the first four and twenty hours. The slip of plaster by which we keep the parts in union, is to be applied by one end to the cheek or to the temple, thence pass over the wound, and be fixed by its other end to the forehead or to the nose; for if it be short, and applied merely over the wound, it will soon be moistened and displaced by the tears.

If the wounded canal does not unite, but each end of the division cicatrizes separately, little is to be hoped from making raw the edges of the wound, and again trying to unite them with greater accuracy.

CHAPTER II.

Of Erysipelatous Inflammation of the Parts covering the Lachrymal Sac.

The appearance of the integuments in this case is similar to that produced by erysipelas in any other part of the body. There is a pale yellowish-red, semi-transparent, and shining tumefaction of the part affected. This swelling has no well-defined limit, but besides covering the site of the lachrymal sac, extends to the surrounding parts, and especially to the upper eyelid. The redness disappears on the slightest pressure, but almost instantly returns. The pain is inconsiderable, and not at all oscillatory. The papillae lachrymales, or little conical eminences in the apex of each of which one of the puncta lachrymalia is placed, sympathize with the parts by which they are surrounded, as do also the lachrymal canals. The former are seen to have shrunk, and the latter refuse to absorb and convey into the sac the fluids collected in the lacus lachrymarum or little pit in the nasal angle of the eye, where the tears

are collected. If the erysipelas spreads over the face, as it sometimes does, an inordinate discharge of thin and irritating fluid takes place from the nose.

When the inflammation is more severe, and extends more deeply, the colour of the skin is dark-red, the pain is acute and throbbing, and the swelling is greater than in the former case. The papillae are now so much contracted that the puncta seem completely closed. The nostril upon the side affected is dry, and so uncommonly sensible that the slightest irritation of the Schneiderian membrane causes violent sneezing. Such are the symptoms during the first or inflammatory stage.

In the second stage, this inflammation seldom comes to a distinct suppuration. The redness of the part increases, but the heat and pain diminish, and an oozing fluid renders the skin moist and slippery. Sometimes this fluid first appears in a number of vesicles over the erysipelatous surface, and these bursting form scales and crusts. The integuments become wrinkled as the tumefaction diminishes, and the scales and crusts fall off as the epidermis is reproduced. For some time, a secretion more copious than the natural takes place from the caruncula lachry-

malis and Meibomian glands, and accumulates during the night in the nasal angle of the eye. The papillae are again developed, and the absorption of the tears is renewed. At the same time there is in general a slight accumulation of mucus in the lachrymal sac, which upon slight pressure can be evacuated either through the puncta or through the nasal duct. The secretion of mucus from the nose becomes natural. Such is the course of the mildest cases.

If the lachrymal canals have participated more than common in the disease, the reabsorption of the tears does not take place immediately upon the inflammation subsiding. On the contrary, a stillicidium lachrymarum continues when all the other symptoms have disappeared.

If the inflammation is severe, and extends beneath the integuments, the lachrymal sac, at the commencement of the second stage, becomes completely filled with mucus, which can always be discharged by pressure. At the same time, the erysipelas ends in a real process of suppuration; the subcutaneous cellular substance becomes disorganised in order to make room for the matter of an abscess; this matter collects be-

tween the integuments and the orbicularis palpebrarum ; sometimes it makes its way between the fibres of that muscle, penetrates the fibrous layer by which the sac is immediately covered, and comes into contact with the anterior part of the sac, which is already distended by the presence of an inordinate quantity of mucus. At last, the integuments give way in one or more points, and the abscess is discharged. The appearance of the parts is now apt to impose upon a superficial observer. There is the tumour of the sac ; there is the fistulous opening of the integuments. He probably pronounces the case to be a fistula lachrymalis, and forthwith opens the sac.

Let us distinguish this case from another to which it bears some resemblance, but with which it must by no means be confounded. It may happen that the purulent matter accumulated under the integuments has actually penetrated the anterior side of the sac, which thus comes to be filled with pus received from without, in the production of which its lining or mucous membrane has had no share. This latter case, which, for the sake of distinction, may be called spurious fistula of the lachrymal sac, must be carefully distinguished both from the former, in which the sac is entire though

distended with mucus, and from those diseases hereafter to be described, in which the purulent matter that fills the sac, is the result of inflammation of the lining membrane of the sac itself.

When erysipelas covering the lachrymal sac has ended in abscess, and this has burst through the integuments, we can readily ascertain whether the sac be or be not penetrated by the pus. When it is actually penetrated, the slightest pressure with the finger upon the superior part of the sac, produces a discharge from the external opening, not of pure pus, but of pus mixed with mucus, and, if the lachrymal canals have already recommenced their functions, mixed also with tears. We convince ourselves still further of the real state of the case by the cautious use of a fine whalebone probe.

Whatever cause is observed to give rise to erysipelas in any other part of the surface of the body, is extremely apt to induce it in the neighbourhood of the eyelids. Violent and long-continued weeping is peculiarly likely to bring on the present disease; especially in individuals of a delicate skin, who after weeping, suddenly expose themselves to a cold air. Frequently it arises suddenly, without any in-

jury of the parts, and in such cases it probably owes its origin to atmospherical changes.

In the first stage, if the erysipelas be superficial, the prognosis is very favourable; a transient atony of the puncta and canals being all that is apt to remain, unless the disease be neglected or improperly treated. If the inflammation be severe, the prognosis is far from being favourable; for in this case there is the danger of the sac being penetrated by the purulent matter of the subcutaneous abscess.

Even during the second stage, the prognosis is favourable, so long as the progress of the disease is characterized by a merely oozing discharge and the formation of scales and crusts. We must, on the other hand, be very considerate with our prognosis, if an abscess threatens to form. An erysipelatous abscess is not bounded like one which is phlegmonous, by a circle of adhesive inflammation, but it extends extremely irregularly in different directions, and frequently produces wide-spreading sloughings of the subcutaneous parts, while the skin remains almost entire. The suppuration may include the canals, and either entirely destroy them, or render them unfit for performing their function. The consequence will be an incurable stillicidium.

The suppuration may destroy the ligamentous layer of the lower eyelid; penetrate into the sac, and even disorganize it to such a degree, that after the parts have healed, its cavity shall have entirely disappeared. Even when the sac is left entire, its sides, if the canals have been destroyed, must be made to adhere by artificial means, in order to prevent a disease which shall be carefully described in another chapter under the name of mucocele.

During the inflammatory stage of this erysipelatous inflammation, if the attack be very slight, the mere continuance of the patient in a moist and cool air is sometimes sufficient for its removal. In common cases, a piece of folded linen dipped in cold water applied to the parts affected, and the administration of gentle doses of sulphate of magnesia, make up the treatment. In severe cases, it will be found necessary not only to continue the cold applications, and to open the bowels, but to administer an emetic of tartrate of antimony, to purge freely, and even sometimes to take blood from the arm.

At the commencement of the suppurative stage, the patient must first of all be placed in a warm and dry atmosphere. A dry linen com-

press ought to be laid upon the affected integuments. Gentle diaphoretics ought to be given. If the symptoms indicate the formation of a subcutaneous abscess, a warm poultice of bread and milk ought to be applied. Still, we must not leave the matter of the abscess to make a way for itself through the integuments; but as soon as even indistinct fluctuation is perceived, we must open the abscess with the lancet, in order to save the lachrymal sac, and prevent the formation of a spurious fistula.

If we are not called till such a fistula has formed, let us beware of all unnecessary introduction of probes and syringes into the sac. By means of a small syringe, the fistula is to be washed out once a day with tepid water, mixed with a little of the vinous tincture of opium. A small quantity of lint dipped in the same tincture is then to be introduced into the abscess, but not pushed so deep as to enter the lachrymal sac. After the fistula has healed, the blenorrhœa which may remain is to be treated as shall be explained in the fourth chapter.

CHAPTER III.

Of Acute Inflammation of the Excreting Parts of the Lachrymal Organs.

With the feeling of obtuse, deep-seated pain, extending to the nose and even to the eye-ball, a swelling appears in the situation of the lachrymal sac, having the shape of a bean, accurately circumscribed, hard, very sensible to the touch, and affected with stinging pain whenever it is pressed. This swelling becomes gradually red, at last extremely red, and then the least touch is insupportable. The papillae are shrunk, the puncta are scarcely visible, the absorption and conveyance of the tears into the lachrymal sac, and through the nasal duct into the nose, are completely stopped, and a stillicidium or discharge of tears and mucus takes place from the nasal angle of the eye. The nostril on the affected side is at first uncommonly moist; but it soon becomes dry, the inflammation extending to the mucous membrane of the nose. The inflammation affects the caruncula lachrymalis, and the conjunctiva,

spreading also to the orbicularis palpebrarum, and to the integuments of the lower eyelid. The redness about the nasal angle of the eye, extending with some degree of swelling even to the cheek, gives to the parts when viewed at a distance an appearance as if the integuments were attacked by erysipelas ; but on a nearer examination, the peculiar redness and all the other characteristics of phlegmonous inflammation are recognised ; and in the midst of the diffused discolouration and tumefaction, the circumscribed swelling of the lachrymal sac is evident not merely to the touch, but even to the view.

The primary and chief seat of this disease is the mucous membrane of the whole of the excreting parts of the lachrymal organs. When the pure inflammation has reached its highest degree, and is about to pass into the suppurative stage, this mucous membrane begins to be exceedingly tumified. The tumefaction of the parietes of the lachrymal canals and of the nasal duct is very soon so great, that these tubes cease to be pervious. The same tumefaction extends also to the parietes of the sac. The nasal duct being inclosed in an osseous canal cannot become tumified by inflammation, and at the same time leave a free passage to the tears.

The anterior side of the sac, on the other hand, being covered only by soft parts, is gradually distended, so as to form the bean-shaped tumour already mentioned. This tumour becomes much more considerable when the disease is so far advanced that the mucus secreted is of an inordinate quantity and puriform. Occasionally there takes place such a change in the texture of the parietes of the canals, sac, and duct, that they can scarcely ever return to their natural state. The thickening of their mucous and fibrous coats continues in this case after the inflammatory disease has run its course; and when the inflammation is violent, this thickening is sometimes so great as to produce the complete and incurable obliteration of the excretory lachrymal apparatus. This permanent obliteration appears to depend upon an effusion of coagulable lymph into the substance of the mucous and fibrous coats, and into the cellular substance by which these are connected and surrounded. Stricture of a portion of one or both of the canals, or of the duct, is produced in the same manner.

Weakly patients, towards the end of the inflammatory stage, complain of headach, and present the other symptoms of febrile disturbance of the constitution.

As happens with all mucous membranes in a state of inflammation, a very abundant morbid secretion of mucus takes place at the transition of the first into the second stage. This fluid collects in such a quantity within the lachrymal sac, that the tumour is strikingly increased in size, and is felt distinctly to fluctuate. The accumulated mucus cannot escape in any considerable quantity from the sac into the nose, on account of the swoln state of the lining membrane of the nasal duct, or it may be on account of its actual obliteration or at least stricture. From the same causes the accumulated mucus cannot be regurgitated by the lachrymal canals. Besides, though the tears are more plentifully secreted during this disease than during health, they are not absorbed and conveyed into the sac, where they might have the effect of diluting this morbid mucous secretion. With the commencement of the suppurative stage, there is also a morbid secretion from the caruncula lachrymalis and the mucous membrane of the nose.

The tumour of the lachrymal sac increases more and more, the redness becomes darker, the skin over the tumour more and more shining, the fluctuation more distinct, and the morbid secretion is now completely puriform. The

sac and the parts by which it is covered, altered by inflammation, are incapable of any further distention. In the middle of the swelling, a yellowish, soft point is observed. If the collection of puriform mucus now be left to itself, this matter will indeed work a passage through the orbicularis palpebrarum, and through the integuments, or in other words a fistula of the lachrymal sac will be formed; but by this opening, the thinner parts merely of the puriform secretion will be discharged, and the tumour will be but inconsiderably diminished.

By and bye we observe, when we press upon the superior part of the sac, that not merely puriform mucus is discharged by the wound which we may have made, or by the fistula, but occasionally also a quantity of pure tears—a proof that the conveyance of the tears into the sac is re-established.

For some time after the process of suppuration has ended, there continues from the mucous membrane of the sac a morbid secretion, opake and still somewhat like pus. It occasionally accumulates so as to push out the little plug of lint, which may have been placed in the opening of the sac.

At length this morbid secretion also ceases in its turn, and the proper mucus comes to be secreted in its natural quantity. It is in general transparent, although for a while it presents occasional streaks of a white colour. These at last entirely disappear, and the mucus becomes thinner in consequence of a due intermixture of tears. The opening of the sac now heals either spontaneously or by the assistance of art. Most frequently it begins with contracting to an almost capillary aperture, by which, if the nasal duct has not returned to its natural dilatation, tears and mucus are discharged. Should this capillary opening close, and the duct still continue impervious, the patient is obliged several times in the day to press upon the sac, that the mucus and tears which it contains may be discharged through the lachrymal canals.

Among the causes of this disease, slight contusions are those most frequently noticed by patients. Professor Beer mentions a child of four years old, in whom it arose from the irritation of a large pea which had been thrust so deep into one of the nostrils, that it was with difficulty extracted.*

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* Praktische Beobachtungen ueber Augenkrankheiten. Wien, 1791. Seite 32.

When this disease arises from no considerable injury of the sac, but from some slight, perhaps unknown cause, the prognosis is very favourable during the first stage; that is, before the secretion of puriform mucus has commenced. If the disease has reached the suppurative stage, we have to contend indeed with a blenorrhœa, with a morbid secretion and accumulation of mucus; but under proper treatment these symptoms will readily disappear. When the inflammation is from the beginning severe, or the case has been neglected or mistreated, the nasal duct and lachrymal canals run the risk of obliteration; and it is to be accounted fortunate if the duct is obliterated at its lower extremity only, or the canals merely at their termination in the sac. Not unfrequently the whole length of the duct is converted into a ligamentous, almost cartilaginous substance, which baffles every attempt to restore its natural caliber; and in this case, both the lachrymal canals and the sac itself usually become impervious. The possibility of such events must be borne in mind, when we are called in even during the first stage.

The prognosis during the second or suppurative stage is extremely dubious. No surgeon, however great his experience, can know how

far during the first stage, the permeability of the canals has been effected; nor can he at this period attempt to ascertain by probes the state of the parts affected, without exposing them to essential injury. At the moment when the mucous secretion has become increased in quantity, without yet partaking of the nature of pus, the prognosis is still somewhat favourable. If we are called in just as the suppuration has fairly commenced, our treatment may perhaps moderate that process; and, at least, we have it in our power to open the sac at the proper time and in the proper place. If we are later, we probably have a fistula to contend with.

It is by combating the inflammation that we are to cure this disease, and not by attacking merely one or even several of the symptoms. Dilatation, for instance, by the introduction of probes through the canals, into the sac, and even into the nose, would only be subjecting the inflamed parts to a new cause of irritation, and might thus produce effects which would render a complete cure difficult if not impossible.

The method of treatment before the process of suppuration has commenced, is sufficiently simple. In mild cases, it consists in observing the antiphlogistic regimen, and in carefully

applying to the inflamed parts a piece of folded linen, moistened either with cold water, or with a diluted solution of acetate of lead. In severe cases, bleeding at the arm, immediately followed by the application of leeches in the neighbourhood of the inflamed parts, ought to be employed. Should any constitutional symptoms supervene towards the termination of this stage, the bowels are to be freely opened, and a gentle degree of perspiration maintained by the use of some of the common diaphoretics. Our object here is to arrest the process of inflammation, and to prevent it from passing into suppuration.

Where this is impossible, and the symptoms declare that the process of suppuration is commencing, our debilitating plan of treatment should immediately cease. If it be continued, the mucous membrane, which is the seat of the inflammation, swells much more than it would have otherwise done, and the consequent blenorrhœa continues so stubbornly that it threatens sometimes to be inveterate and incurable. The cold lotion should now give way to a warm poultice, made of bread and milk, or of a roasted apple.

Should our hopes of checking the disease

be still disappointed, and the secretion of puriform mucus go on augmenting, the sac must be opened with the knife, as soon as it is so overfilled and the parts which cover it so far disorganized that the middle of the tumour becomes soft and yellowish, pointing like an abscess. We make our incision in the direction of the longer diameter of the tumour, and as we withdraw the lancet, the incision is to be enlarged downwards that the matter may have a free exit.

After this opening has continued for several days, and the matter has been freely evacuated, if the sac should continue hard, a warm poultice of cicuta with camphor should be applied, or what will answer the purpose better, though it be rather a kind of old woman's prescription, a roasted onion.

As soon as the object of this application is gained and the hardness gone, the wound is to be filled with a small quantity of soft lint, dipped in the vinous tincture of opium, and the whole covered with a piece of adhesive plaster. Under this treatment the process of suppuration diminishes, and the matter discharged begins to lose more and more the character of pus, and to approach to that of mucus.

Should this unnatural secretion threaten to become habitual, the small quantity of lint introduced into the wound is to be covered with an ointment (No. 1.) containing a little red precipitate and some prepared tutty. The wound is to be dressed daily with this ointment ; but after removing the old dressing and the mucus which may have accumulated, a little of the solution of the lapis divinus (No. 2.) made lukewarm, is to be dropped into the nasal angle of the eye, and some of the same solution is to be injected through the wound into the sac.

At this period, if the treatment has been properly conducted, we most frequently find that the lachrymal canals and the nasal duct have of themselves become permeable, the secretion of mucus natural in quantity and quality, and mixed duly with the fluids absorbed from the lacus lachrymarum. We therefore proceed to apply such dressings to the opening of the sac as may induce it to close. If we have any doubt of the complete permeability of the lachrymal canals and nasal duct, we have recourse to that examination of the parts which I shall describe in the tenth and eleventh chapters.

CHAPTER IV.

Of Chronic Blenorrhœa of the Excreting Parts of the Lachrymal Organs.

The inflammation with which chronic blenorrhœa of the excreting parts of the lachrymal organs commences, is very seldom considerable. In scrofulous patients especially, the inflammatory stage is not unfrequently completely overlooked, and no advice is asked or treatment thought of, till mucus has accumulated to such a degree as considerably to distend the lachrymal sac. When we press upon the bean-shaped tumour formed by this distention, a quantity of puriform mucus wells out through the puncta and overflows the eye; for so far are the canals from being obstructed, that except when a relapse of the disease takes place, and a renewal of the inflammation, they even absorb and convey the tears into the sac. Rarely, however, can our pressure empty the contents of the sac through the nasal duct, as its permeability for the most part continues suspended by the tumefaction of its mucous membrane;

and hence also the patient almost constantly complains of dryness in the nostril. The evacuation of the contents of the sac, whether by the duct or by the canals, produces but an inconsiderable diminution in the tumour.

In the course of this tedious disease, the accumulated mucus varies much both in quantity and in quality. For instance, the mucus accumulates more rapidly and is much thicker after a good meal than at other times. The secretion of it is very plentiful, but thinner than usual, when the patient continues long in a moist and cold atmosphere. In this case, the overfilling of the sac takes place so rapidly, that the compression of the orbicularis palpebrarum in the action of winking is sufficient to evacuate the sac through the canals to such a degree that the whole surface of the eyeball is suddenly overflowed, and the puriform fluid runs down upon the cheek. After the patient remains for a short time in a warm and dry atmosphere, the morbid secretion becomes sparing and ropy. We find that this chronic blenorrhœa almost completely disappears in many individuals during warm weather, upon which the yet unexperienced patient and the unexperienced surgeon are apt to express a great but a premature joy, for on the very

first change to cold and wet weather, the disease most frequently returns as before.

During chronic blenorrhœa, the lachrymal sac is extremely liable to repeated attacks of inflammation; in consequence of which a fistula of the sac very frequently forms. The fistula in such circumstances is usually complicated with several sinuses, and accompanied by another striking characteristic of chronic and especially of scrofulous inflammation, namely, a tendency to induration, and almost to schirrosity, in the cellular substance around the fistulous opening or openings.

This disease, the most frequent of all those to which the excreting parts of the lachrymal organs are liable, may be regarded as the same with that which we have considered in the last chapter, only modified by some constitutional disorder, in most cases by scrofula. There are other portions of the mucous system, the inflammation of which is strikingly modified by this latter cause. Mr. Hunter "suspected that there was something scrofulous in some gleets."* Indeed it may be asserted in general, that the

* Treatise on the Venereal Disease. London, 1810. Page 159.

effect of scrofula upon any inflammatory disease is to prolong its second stage, and to render it chronic. In other cases this chronic blenorrhœa of the excreting parts of the lachrymal organs appears to depend upon the weakly constitution of the patient, although he be free from scrofula; and in others, it is evidently kept up, and in some it appears to be produced, by the disordered state of the digestive organs.

Even regarded locally, the present disease is seldom a primary affection, but is most frequently excited by catarrhal inflammation of the Schneiderian membrane, or by a long-continued disorder of the Meibomian glands. Very often it is complicated, at least so far as its origin is concerned, with other constitutional diseases besides those already mentioned. Small-pox, measles, scarlet fever, frequently call into action an occult scrofulous disposition, and at the same time give rise to the particular local disease which forms the subject of this chapter.

As for the prognosis, it must of course vary according to the constitutional cause to which the prolongation of this local affection must be attributed. For instance, when scrofula is present, much depends upon whether the scrofulous diathesis be completely developed in the

patient, merely commencing to declare itself, or, as happens at certain periods of life, already beginning to retreat. Very frequently, we shall find it impossible to effect a cure, while the scrofula continues in activity; and a similar observation may be made in regard to those cases, in which the disease is kept up by the weakly constitution of the patient, or by the disordered state of his digestive organs. Even when we succeed in removing the blenorrhœa, we cannot pronounce the disease to be radically cured, nor ought the patient to deviate from such a general plan of treatment as the bad state of his constitution may recommend.

When scrofula is present, much depends upon the class of scrofulous patients to which the individual belongs. The morbid changes in the form and texture of the excretory lachrymal organs are much more extensive and obstinate in those lifeless, sluggish individuals, who are characterised by the swoln nose and upper lip, and the enormous enlargement of the lymphatic glands, than in those very irritable scrofulous persons, in whom the lungs become so frequently the seat of rapid and fatal disease. In the former, indeed, the whole mucous system is extremely liable to chronic diseases; so that

females of this class not unfrequently labour even from childhood under fluor albus.

The oftener a blenorrhœa, already become in some measure habitual, has been attended with new attacks of inflammation, the less is our hope of ever curing it. If, in consequence of these renewals of inflammation, a fistula of the sac should form, there commonly follows a complete closure of the nasal duct, and even the mucous membrane of the sac itself becomes so extremely tumefied, that the parietes approach each other more and more nearly, till, at last, the attacks continuing to be repeated, the cavity is completely obliterated. Need I say, that after this termination, perforation of the os unguis and every other method of treatment are unavailing?

Should the tumefaction and induration of the mucous membrane and of the surrounding parts become so great, that after complete evacuation of the sac, the swelling is but little diminished and scarcely yields to the pressure of the finger, the cure is extremely tedious and rarely comes to be complete. Both the nasal duct and the sac most frequently remain in this case impermeable, and even though the blenorrhœa ceases, a stillicidium lachrymarum continues.

If the evacuation of the sac during this disease be left entirely to the action of the orbicularis palpebrarum, instead of being carefully and frequently effected by pressure, this spontaneous evacuation will take place more and more seldom, the sac will become more and more over distended, the swelling even after the most complete evacuation will merely subside and not disappear, and a manifest laxity will become obvious in the anterior part of the sac and in the parts by which it is covered. This is a particular state, of which I shall treat in a subsequent chapter, under the name of relaxation of the sac.

The local treatment of chronic blenorrhœa of the excreting parts of the lachrymal organs, does not differ essentially from the local treatment of the inflammation of these parts, as detailed in the last chapter. But along with this local treatment, we must employ every means which we possess of improving the general health of the patient; and indeed, unless the constitutional treatment be attended to, all local means will be used in vain. In scrofulous cases, the constitutional treatment consists chiefly in regulating the patient's diet and manner of life. In weakly persons, the employment of the preparations of iron will be

found highly beneficial. When the prolongation of the disease depends upon a derangement of the digestive organs, it will be necessary to begin with restoring these to a healthy state. This will be best effected by the treatment which has been recommended by Mr. Abernethy.*

Injections through the puncta by means of Anel's syringe, and the still more senseless use of Anel's probe, are extremely hurtful in this disease. By such practices, the parts are to a certainty irritated, and their texture injured. Professor Schmidt relates two cases that fell under his own observation, in which the papillae lachrymales were absolutely split in consequence of the repeated introduction of these instruments, so that the patients were left with incurable stillicidium. I grant that the application of certain substances to the mucous membrane affected, is one of the most powerful means which we possess of correcting its disposition to chronic blenorrhœa. But he who believes that the best manner of applying these substances is to inject them by Anel's syringe introduced through the puncta, is lamentably

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* Surgical Observations on the Constitutional Origin and Treatment of Local Diseases.

mistaken ; he is, in fact, closing his eyes upon what he must know of the functions of the several parts of the lachrymal organs, and is doing that very thing which is calculated to prolong and to exasperate the disease. Except at the time of a smart renewal of the inflammation, the puncta and canals during this disease continue in the exercise of their functions. Whatever fluid therefore is dropped into the lacus lachrymarum will be taken up by the puncta, conveyed through the canals, and applied to the whole internal surface of the sac. Even ointments, placed within reach of the puncta, will be absorbed in the same manner.

We ought then, first of all, to empty the sac by pressure, and, if possible, to do this through the nasal duct into the nose. Having placed the patient horizontally upon his back, we drop into the lacus lachrymarum a small quantity of a very weak solution of corrosive sublimate, (No. 3). After remaining for a quarter of an hour in that position, he ought to rise, but without wiping away any part of the collyrium which may remain. After another quarter of an hour, the eyelids are to be carefully dried, and a little of Janin's ointment (No. 4.) applied with a camel hair pencil, to the caruncula lachrymalis, and the edges of the eyelids. All

this is to be carefully repeated twice a-day. Professor Schmidt recommends as a collyrium, a mixture of rose water, nitric acid, and spirit of wine, (No. 5.)

A tendency to induration and almost to schirrosity is a symptom of this disease of which I have already taken notice. Should such a tendency be present, gentle friction over the part ought to be used, with a little camphorated mercurial ointment.

If the blenorrhœa depends upon a chronic inflammation of the Meibomian glands, our remedies must be directed principally against this, and amongst these the diluted citrin ointment, (No. 6.) applied every evening at bedtime, by means of a hair pencil, to the internal surface of the eyelids, will be found extremely beneficial.

CHAPTER V.

Of Stillicidium Lachrymarum.

It is highly necessary to distinguish this disease from epiphora. The cause of stillicidium lies in some obstacle to the absorption and conveyance of the tears from the lacus lachrymarum into the sac. Epiphora, on the other hand, consists in a superabundant secretion of tears, is a disease of the secreting, not of the excreting parts of the lachrymal organs, and therefore does not come within the scope of the present Essay.

I have nothing farther to add to what has been said in the preceding chapters, regarding stillicidium as a symptom merely of inflammation of the sac and neighbouring parts. As the inflammation subsides, this symptom disappears. Neither do I mean to treat of incurable stillicidium, arising from obliteration of any of the excreting parts of the lachrymal organs. The stillicidium now to be considered, is the result of relaxation of the puncta and canals,

is most frequently a sequela of inflammation, continuing after all the other symptoms have disappeared, and is to be regarded as a curable disease.

The symptoms of this disease are the following. The puncta, in other respects perfectly natural, stand widely open. Upon irritation, with the point of a fine probe, the papillae do not shrink, nor do the puncta close, as in the healthy state. The quantity of tears, which from time to time roll over the cheek, is not considerable; they fall in single drops, at intervals, and only from the nasal angle of the eye. The nostril belonging to the affected side is dry, as little or none of the fluids collected in the lacus lachrymarum is conveyed into the sac, there to mix with the mucus secreted by its lining membrane, and thence to be discharged into the nose.

Erysipelatous inflammation of the eyelids, or of the integuments covering the lachrymal sac, blenorrhœa of the eyelids, and ophthalmoblenorrhœa are extremely apt to give rise to the present kind of stillicidium. One cause of stillicidium after ophthalmoblenorrhoea, is the extreme tumefaction and relaxation of the semi-

lunar membrane, by which the tears are prevented from reaching the puncta lachrymalia.

The prognosis is always favourable; for the disease will either disappear under the influence of warm and dry weather, or it may be removed by the careful employment of astringents.

A solution of borax in peppermint water, with a small quantity of camphorated spirits, or of tincture of opium; a solution of the sulphate of iron; or a pretty strong solution of the lapis divinus, with the same addition of spirit or of tincture, may be used. These are to be dropped into the nasal angle of the eye several times a day, the patient lying on his back for some minutes after the application.

CHAPTER VI.

Of Fistula of the Lachrymal Sac.

Professor Schmidt mentions a single case, in which fistula of the lachrymal sac arose from a penetrating wound. It is understood from what has been said in the foregoing chapters, that this disease is usually the consequence, either of mistreatment or neglect of the acute inflammation of the excreting parts of the lachrymal organs, or of reiterated attacks of inflammation in the same parts during the course of chronic blenorrhœa. If the inflamed sac be not opened at the proper time, but the collection of puriform mucus be left to itself, it will form a passage through the fibrous layer by which the sac is covered, through the orbicularis palpebrarum, and through the integuments. The opening thus formed may close soon after, and every thing go on well. But in many cases the opening contracts merely, manifests no disposition to heal, and degenerates into a fistula of the sac. While employing this term fistula, let us not forget any part of its import. Let us remember that it implies a narrow canal,

with a small opening, the circumference of which is hard and callous.

When the puriform mucus is left to find a passage for itself, it rarely happens that the opening through the anterior part of the sac is directly opposite to that which is wrought through the fibrous layer of the lower eyelid, the orbicularis palpebrarum, and the integuments. It even sometimes happens, that though there be but one fistulous opening through the sac, the matter forms between the sac and the skin several sinuses, which open by small orifices at different places, more or less remote from the sac and from one another.

The diagnosis of a fistula of the sac is not difficult, for as soon as we press with the finger upon the superior part of the sac, there runs from the fistulous opening a quantity of puriform mucus.

In order to distinguish the case in which the opening through the skin corresponds with the opening through the sac, from that in which the two openings are separated from each other by a sinus of considerable length, the former case may be termed simple, the latter complicated fistula. When complicated fistula occurs in

individuals of sound constitution, the integuments will be found to be more than ordinarily thick and firm, and the case to have been totally neglected. Complicated fistula occurs most frequently in patients of a bad constitution, is then the result of often renewed inflammation of the sac during chronic blenorrhœa, and not unfrequently presents three or four openings through the integuments. In such patients, it occasionally happens that the matter penetrates not merely through the anterior part of the sac, but through its posterior part also, and through the os unguis into the nose, thus causing what may be distinguished by the name of carious fistula. This particular variety seldom if ever occurs, unless the individual is affected with scrofula, syphilis, or some other constitutional disease. Even when inflammation of the excreting parts of the lachrymal organs is in the greatest degree neglected, caries of the os unguis is extremely rare, if the patient's constitution be perfectly healthy.

The least disagreeable circumstance which takes place when inflammation of the sac has ended in fistula, is an external cicatrice more or less visible. In general, the cicatrice is pretty deep, and according to its depth and extent it invariably produces a degree of ectropium. In

every case of fistula, there is a danger of a long-continued atony of the puncta and canals, with consequent stillicidium, of disorganization of the canals from tedious suppuration or from supervening ulceration, of destruction of the sac and nasal duct from the same causes, and, in certain states of the constitution, of caries of the os unguis. If the fistula be allowed to continue for a great length of time, contraction or even obliteration of the nasal duct, from disuse, is an unavoidable consequence.

The prognosis is favourable, when on pressing the sac a quantity of tears issues along with the morbid mucous secretion, although not mixed with it; for this proves that the absorption of the tears by the puncta, and their conveyance into the sac by the canals, are restored. The restoration of the nasal duct only now remains doubtful.

When a case of fistula of the sac presents itself, we have first of all to examine the fistulous opening with a fine whalebone probe, and to ascertain whether the fistulous opening of the integuments correspond or not with that of the sac. If we have convinced ourselves of the correspondence of these openings, the point of a small lancet is to be introduced into the fis-

tula, and the opening both of the integuments and of the sac enlarged upwards and downwards. By the considerable opening thus made, a quantity of soft lint, moistened with the vinous tincture of opium, is to be passed into the sac, but not to such a depth as to fill or stop it up. Over the lint is applied a piece of adhesive plaster, and over the plaster a warm cicuta poultice with camphor. This treatment is to be continued till no trace of the fistulous hardness remains. During this treatment the absorption and conveyance of the tears into the sac are frequently re-established, and a similar restoration occasionally extends to their conveyance into the nose.

When the fistula is complicated, we carefully examine with the whalebone probe the fistulous opening or openings, and ascertain the direction of the sinus or sinuses. If the sinuses are superficial, which may sometimes be judged to be the case from the discoloured streaks which are seen extending from their external orifices towards the sac, they are to be laid open with a small bistoury, quite up to the sac. The opening into the sac is then to be enlarged upwards and downwards, as in the former case. The same treatment also as in simple fistula is to be followed.

Should one of the sinuses be so deeply seated, that in order to lay it open it would be necessary to divide a considerable quantity of muscular substance, vessels and nerves, we content ourselves with enlarging the fistulous opening; after which we pass a common silver probe along the sinus to its commencement in the sac, and then divide the integuments immediately over the end of the probe, so as to form a counter-opening to the sinus. Through the sinus, diluted vinous tincture of opium is daily to be injected, the poultice applied as before to promote the removal of the hardness which reigns throughout the sinus, and this being gained, the cure is to be completed by compression. So long, however, as any hardness remains, compression is of no use; even if the opening heal up, the sinus continues, and the opening after a while returns. As for the sac, it is to be treated as in the former case.

It occasionally happens that one of the sinuses is so deeply situated, that a portion of the superior maxillary bone over which it runs is laid bare or becomes carious. When this is the case, the fistulous opening is surrounded by fungous granulations, an ichorous matter is discharged, and the denuded or carious bone is felt with the

probe. Diluted tincture of myrrh is to be injected into the sinus, and the lint with which the parts are dressed is to be moistened with the same preparation.

Such is the treatment of the different varieties of fistula of the lachrymal sac, with the exception of that variety in which the os unguis is carious, a subject which I shall consider in a separate chapter. I have only further to remark under the present head, that no fistula is to be allowed to close, till the surgeon shall have made the examination of the lachrymal canals and of the nasal duct, to which I have already referred, and which I shall describe in the tenth and eleventh chapters.

CHAPTER VII.

Of Caries of the Os Unguis.

This is a much less frequent disease than is in general supposed. "For my own part," says Mr. Sharp, "since I have doubted its frequency, it has not been my fortune to meet with a single instance of it."* Janin observes, "It is so rare to find this bone carious, that, without external causes, I doubt if it can become so. Among the great number of diseases of the lachrymal sac which I have treated, I have found only a single case of caries, and this was occasioned by a gunshot wound."† M. Demours puts the following questions concerning the diseases of the os unguis. "The bone, is it denuded once in a hundred times? In those cases in which it is denuded, is it carious once in twenty times?"‡

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* Treatise of the Operations of Surgery. London, 1758. Page 178.

† Mémoires sur l'Oeil. Lyon, 1772. Page 119.

‡ Traité des Maladies des Yeux. Paris, 1818. Tome I. page 159.

It cannot be doubted that carious fistula occasionally arises in the manner described in the last chapter. Neither is there any doubt that the os unguis sometimes becomes affected with inflammation from scrofula, and oftener from syphilis, and that the inflammation in these cases may terminate in caries. The idea of the frequency of caries of this bone, which, notwithstanding the testimony of Sharp and Janin, has continued to prevail, appears to be founded chiefly upon the mismanaging treatment of surgeons themselves, and above all is to be attributed to their rude examination of the parts, with probes and other instruments. A patient presents himself with fistula of the lachrymal sac ;—the idea of caries starts up in the surgeon's mind, and he forthwith takes a probe in order to examine whether there is caries or not ;—he penetrates the posterior part of the lachrymal sac, touches the bone with the point of the instrument, which he moves about to this side and to that, in order to make himself sure of what he is seeking for ;—and at last distinctly feeling the bone, which he has denuded, he pronounces the os unguis to be carious.

In cases of caries of the os unguis from scrofula or syphilis, the swelling is more deeply seated, and the symptoms of disease in the ex-

cretory apparatus of the tears are more slowly developed than in primary affections of these parts. For some time after the obscure tumefaction has continued, with very considerable pain, in the neighbourhood of the os unguis, the excreting lachrymal organs continue to execute their functions; whereas the tears are no longer absorbed nor conveyed into the nose, when the mucous membrane is the part first affected. At length, the lachrymal sac and nasal duct becoming inflamed, the symptoms bear a nearer resemblance to those described in the former chapters. The posterior part of the sac becomes ulcerated, and unless some successful plan of treatment be adopted against the constitutional disease, the caries of the bones and the ulceration of the soft parts continue, the lachrymal organs are destroyed, and even the integuments are penetrated.

In such cases, little ought to be attempted in the way of local treatment. Every thing which could irritate the parts is especially to be avoided. If the local affection depends upon syphilis, the proper remedies against that disease are to be exhibited, and a similar plan of treatment must be followed if the caries appears to be of scrofulous origin. No operation practised upon the parts can be of any use, so long as the

scrofulous or syphilitic action is going on. On the contrary, such an operation would in all likelihood exasperate the disease, and render that certain, which, even in the least unfavourable case of this kind and under the best directed treatment, is scarcely avoidable, namely, the obliteration of the lachrymal sac.

The local treatment then, so long as the constitutional cause remains unsubdued, consists in the mildest applications. If we are happy enough to check the constitutional affection, before the local disease has destroyed the lachrymal sac or its cavity, the blenorrhœa which may remain, or the fistula which may have formed, is to be treated as has been already explained.

CHAPTER VIII.

Of Relaxation of the Lachrymal Sac.

This disease of the lachrymal sac presents a tumour of that particular bean-shape which has been mentioned already; the integuments covering it are scarcely or not at all discoloured, it is not painful, it yields extremely easily to the pressure of the finger, and in no case does it exceed the size of a common horse-bean. These symptoms are sufficiently characteristic to enable a mere tyro to distinguish relaxation from mucocele.

Upon pressure, the contents of the sac in the state of relaxation are discharged either by the canals and puncta, or by the nasal duct, according to the direction in which the pressure is applied. The fluid is usually mild and transparent, or presents merely a streak of whitish matter; but occasionally, from the presence of blenorrhœa, it is entirely yellowish and opake. Upon evacuation of the sac, the tumour is indeed for an instant almost completely

emoved, but its integuments remain folded and wrinkled, and it very soon becomes filled in. If the fluid does not consist of mucus duly mixed with tears, but presents whitish streaks, or if it consists entirely of a catarrhal matter, we feel a little elasticity in the sac after the evacuation, and there even remains some slight degree of swelling. These appearances are to be attributed to the tumefaction of the lining membrane of the sac, and are totally wanting in the more common cases of relaxation.

The sac in this disease has lost its natural contractility of texture. Even that part of the orbicularis palpebrarum which covers the sac, and to which the duty of emptying it belongs when it becomes filled with fluid, having suffered from long-continued extension, is incapable of contracting with a sufficient degree of force, and is in fact exactly in the state of the muscles of the abdomen after removing the water of an ascites. The patient is consequently obliged to do with his finger, what ought to be done spontaneously by the parts themselves. He is obliged to evacuate the sac by pressure frequently in the course of the day, and it is fortunate if he begins and continues the practice of evacuating it by the natural

route through the nasal duct, and not through the lachrymal canals.

The cause of relaxation is the constant over-distention of the sac by puriform mucus, during previous inflammation, and especially during neglected chronic blenorrhœa. Sometimes, as has been already stated, the blenorrhœa still continues, or has recurred. Most frequently, the blenorrhœa has disappeared, and left relaxation behind it, along with an excessive secretion of healthy mucus. In this case we are called upon to limit this secretion, and to restore their natural cohesion and elasticity to the anterior side of the sac, the orbicularis palpebrarum, and the integuments, in order that the orbicularis palpebrarum may be able to recommence this important part of its function—the evacuation of the contents of the sac through the nasal duct.

The prognosis in this disease is always very favourable. The distension and extenuation of the anterior side of the sac, and of the muscle and integuments by which it is covered, are never to such a degree that we should despair, by patient and proper treatment, of restoring their natural and elastic force. We ought indeed

to forewarn the patient that the cure will be tedious, and require much attention upon his part.

The treatment consists in the use of two distinct means, each of which, as may be seen by the testimony of Pellier and others, is, when used alone, apt to fail.*

The first is the compression of the sac; and here let it be observed, that the present is the only case in which compression of the sac is useful. In any other disease of that part, this practice would produce the most destructive effects. The compression must be carefully applied, constantly continued, and gradually increased. Machines have been invented for this purpose, but they never fulfil with precision all these conditions. We cannot by such an instrument as Sharp's or Petit's compressorium, the first invention of which we owe to Hieronymus Fabricius, keep up a regular and an increasing pressure; the compressing surface upon the least occasion, especially during the night, is disarranged; and the patient is hindered from pursuing his business by the presence

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* Pott.—Observations on the Fistula Lachrymalis. Works. London, 1808. Vol. I. page 252.

Pellier de Quensy—Cours d'Operations sur la Chirurgie des Yeux.—Paris, 1790. Tome II. page 207.

of such an apparatus. Graduated compresses then are to be preferred; over these a firm leather pad of a proper form is to be placed; and the whole is to be supported by a narrow roller passing round the head. In this manner the pressure takes place exactly upon the part which ought to be acted upon; it can be daily increased; the pad cannot, even when the patient is very restless, be shoved aside; nor need such an apparatus prevent him from following his ordinary employment, even out of doors.

The second part of the treatment consists in the application of some astringent fluid, both to the external surface of the tumour, and to the internal surface of the relaxed sac. A great variety of astringents might be mentioned as proper for this purpose; such as the sulphate of iron or of copper in solution, an infusion of oak bark, or diluted alcohol. The graduated compresses are to be moistened twice or thrice daily with the astringent fluid which shall have been selected. A small quantity also of the same fluid is to be dropped into the lacus lachrymarum, and left to be absorbed by the puncta, the patient being laid in a horizontal position, and the compresses somewhat relaxed but not removed.

Such is the method of curing a disease which I have shuddered to see treated by incision of the sac, and the passage of various instruments through the nasal duct, operations which are to be regarded as the more severe in such cases, because they are wholly unnecessary. As for the Anelian injections, the direct injury of the papillae, and the over-distention and consequent atony of the puncta so that they can no longer absorb the tears, are only some of the bad consequences of such a practice. Such injections in this particular case would be attended also by a momentary over-filling of the sac, which would be just undoing with the one hand what we were effecting with the other.

CHAPTER IX.

Of Mucocele of the Lachrymal Sac.

If after an acute inflammation or a chronic blenorrhœa of the sac has subsided, the surgeon does not particularly direct his attention to the state of the canals and nasal duct, but forthwith proceeds to heal up either an artificial opening or a fistula of the sac, while the canals and nasal duct remain impervious, either from the presence of inspissated puriform mucus, or from a tumid state of their lining membrane, or from their being absolutely strictured or obliterated, what will be the consequence? The natural secretion of mucus from the internal surface of the sac will go on, but as it can neither be diluted by the tears, discharged into the nose, nor completely reabsorbed by the mucous membrane which secretes it, it will accumulate, and the anterior part of the sac will again be gradually distended into a tumour. Such is the view which may be taken a priori, of the origin of mucocele.

This disease presents in its commencement the oblong shape of the sac, but it grows every day greater, and I have seen it reach the size of a pigeon's egg without bursting. Even when the tumour is no bigger than a moderately distended sac, the integuments are already of a purple colour, and this colour with the growth of the disease constantly becomes darker. A mucocele is so hard that it scarcely yields at all to the pressure of the finger. No degree of pressure is capable of evacuating, either through the puncta or into the nose, the mucus which in this disease is pent up within the lachrymal sac. If any trace of fluctuation be felt in the tumour, it is very indistinct. During the early period of its growth, the tumour is completely devoid of pain. It is not until the over-filling of the sac has reached its highest possible degree, and the mucocele threatens to burst, that the patient complains of a painful feeling of tension, or rather of a continual sensation of pressure in the nose, in the region of the eye-brow, and in the eye-ball. If we touch the tumour inconsiderately, this feeling becomes more perceptible. The patient at this period can no more than half open his eye-lids on account of the size of the tumour.

In examining a mucocele of the lachrymal

sac, we distinguish only a very indistinct fluctuation, and in many cases none at all. This depends upon the consistence of the contained mucus, and the presence of indistinct fluctuation, or its total absence merits our attention when we come to open the mucocele, as the operation is modified accordingly. The contained mucus may be in some measure liquid, or it may have acquired a gluey consistence. In the former case, the colour of the integuments is purplish, an indistinct fluctuation is felt, the tumour is still a little elastic, and does not exceed the size of a horse-bean ; the mucocele is not yet inveterate ; it cannot have continued above a few weeks at most. In the latter case, the colour of the integuments is blue like that of a varicose vein, the mucocele feels like a pebble, and presents not the slightest degree of fluctuation ; the tumour is already so large as to rise over the caruncula lachrymalis; the disease is of at least several months' continuance.

The colour of the integuments in mucocele has led some authors to describe this disease under the name of varix of the lachrymal sac ; and the hardness and size of the tumour, added to its colour, have frequently led those charlatans who were formerly but too often intrusted

with the care of the diseases of the eye, to extirpate the lachrymal sac affected with mucocele, under the idea that they were removing a cancerous tumour.

Mucocele very rarely occurs after the inflammation of the excreting parts of the lachrymal organs has been so violent as to cause the absolute obliteration of the nasal duct. When the inflammation is so violent as to effect this, it almost constantly produces at the same time an obliteration of the sac. The sides of this cavity come together, and the texture of its parietes is so altered by the inflammation, that the sac is incapable of returning to its natural caliber. Neither mucocele nor relaxation can ever afterwards take place, and the case is incurable. It is upon obstruction then, and not obliteration of the nasal duct, that the origin of mucocele usually depends, and this obstruction is accompanied by a similar affection of the lachrymal canals. Yet cases of mucocele do occasionally occur, in which both the lachrymal canals and the nasal duct are absolutely obliterated.

When a patient presents himself with a mucocele of the lachrymal sac, the question is not whether we can remove the tumour merely.

We know that we can always lay open the sac, clear out its contents, and thus remove the mere mucocele. The important question is, whether the absorption and conveyance of the tears into the sac, and their evacuation into the nose, can be restored? but to enable us to answer this question, it is necessary to open the sac, and to clear out the accumulated mucus. When the mucocele has not been the immediate consequence of a violent inflammation, we have reason indeed to hope for a favourable issue, even before the sac is laid open, and the real state of the canals and duct ascertained.

The opening of the sac is to be performed with a lancet fixed in a handle. The instrument is to be introduced into the most prominent part, and pushed on till its point has reached the centre of the tumour. The wound is then to be enlarged upwards and downwards in the direction of the length of the sac, both that its contents may be easily evacuated, and that we may be able to go on without difficulty in the remaining stages of the treatment. In performing this operation, as well as in enlarging a fistula of the lachrymal sac, it is better to avoid if possible dividing the tendon of the orbicularis palpebrarum. Yet the inconvenience arising from cutting that tendon across

is much less than might have been supposed; for after the wound has healed, the eyelids retain their natural position, and the muscle performs its functions as before. This is to be attributed partly to the ligamentous layer which lies beneath the muscle and supports the eyelids, and partly, as Mr. Sharp has remarked, to the firm cicatrice which is left when the cure is completed.*

If the mucus be liquid, a little of it issues as soon as the incision has been completed. The remainder is to be cleared out, by means of a small syringe introduced by the wound, and through which a quantity of water is to be repeatedly injected. If the mucus has entirely lost its fluidity, so as to resemble glue in colour and consistence, it is to be extracted by the repeated introduction of a small pair of forceps. After the mucocele has by this means been pretty well emptied, a moderately sized whalebone probe is to be introduced, and moved about so as to dislodge any of the inspissated mucus that may remain. The sac is then to be completely washed out by injecting tepid water.

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* Treatise of the Operations of Surgery. London, 1758. Page 181.

A small quantity of soft lint is now to be placed within the lips of the wound, and covered with a piece of court-plaster. On the next day, the examination of the lachrymal canals and nasal duct is to be instituted, and the causes upon which the mucocele depends being ascertained, the proper treatment must be commenced.

CHAPTER X.

Of Obstruction of the Lachrymal Canals.

If an artificial opening of the sac has been made during inflammation, or if a fistula of the sac has formed, neither the artificial opening nor the fistula is to be healed up, till the state of the lachrymal canals has been ascertained. The state of the canals is also to be ascertained on the day following the opening of a mucocele. In all these cases, the examination of the canals is to be performed in the same manner.

In this examination it is our object to ascertain, not merely whether the lachrymal canals be obstructed, but also the cause of their obstruction. They may be obstructed from the presence of inspissated mucus, from tumefaction of their lining membrane, or from absolute obliteration in a part or throughout the whole of their extent.

For the examination of the canals we make use of Anel's probe, which is to be held like a writing pen, in the right hand if we are to operate on the left side, and vice versa. The little finger, applied to the cheek, is to serve as a support. By means of the fingers of the hand which does not hold the probe, the eyelid is to be drawn somewhat towards the temple, so as to be put on the stretch ; and the edge of the eyelid to be brought a little forward, so as to bring the punctum into view. If we are examining the superior canal, we first of all introduce the point of the probe into the punctum from below upwards, till it reach the angle of the canal. We now turn the instrument in a circle till its point comes to be directed obliquely downwards and inwards, while at the same time we draw the eyelid somewhat upwards as well as outwards. If we are examining the inferior canal, we introduce the point of the probe into the punctum from above downwards, and then lower the handle of the instrument to a horizontal direction. If upon continuing to press the probe onwards in the directions described, it enters the sac, so that we come to touch the nasal side of that cavity with the point of the instrument, we are assured that there is no obliteration of the canals. If an obliteration exists, a state of the canals

which we may partly suspect from the contracted appearance of the papillae and puncta, we find an inconquerable obstacle to the passage of the probe, and ascertain at once the extent and situation of the obliteration.

When the presence of mucus is the sole cause of the obstruction, the conveyance of the tears through the canals is immediately restored by carrying the probe onwards into the sac. When there is tumefaction of the mucous membrane, the conveyance of the tears is not restored by merely sounding the canals, for as soon as the probe is withdrawn, the contraction of their caliber returns. Such tumefaction, indeed, depends in every case upon inflammation, and consequently will subside only as this disappears.

In any doubtful case, we can easily convince ourselves of the real state of the canals after sounding them, by dropping a small quantity of diluted vinous tincture of opium into the lacus lachrymarum while the patient lies on his back. If the canals execute their office, the fluid will disappear from the lacus lachrymarum without falling down upon the cheek, and will shew itself distinctly by its colour at the opening of the sac.

When one or both of the canals are obliterated through a small part of their extent, for instance for the length of a line, we ought to force the probe, but not violently, through the obliteration into the sac. The edges of the eyelids ought to be kept moist for some days after with a thin and mild ointment, and the probe daily passed along the canal into the sac.

When the canals are completely obliterated, I know no means of preventing an incurable stillicidium. It is easy to describe methods of making new puncta and canals, but it is another matter to get these new puncta and canals to absorb and convey the tears. In such a case we ought to apply lunar caustic to the lining membrane of the sac so as to excite a degree of inflammation, and then by moderate compression, endeavour to secure the obliteration of its cavity. This is the only means which we possess of preventing a mucocele of the sac.

CHAPTER XI.

Of Obstruction of the Nasal Duct.

The examination of the nasal duct, equally with that of the lachrymal canals, is to be instituted before healing up any artificial opening or fistula of the sac; it is also to be instituted on the day after a mucocele has been laid open.

The best instrument for examining the nasal duct is a whalebone probe. This is to be introduced horizontally till it touches the nasal side of the sac, it should then be raised into a vertical position, and its point directed downwards and a little backwards. Turning the probe upon its axis, we pass it from the sac into the duct; and as we continue to press it gently downwards, the instrument, if the sac is pervious, enters into the nose. If its point meets with some obstruction, we must not immediately conclude that there is an obliteration of the duct. We must press down the probe a little more strongly, yet without violence; turning it round between

the fingers, and giving it different directions. By these means the obstacle is frequently overcome, and the probe suddenly descends.

If the obstacle remains as before, and is extremely firm, still this is not sufficient ground for us to conclude that there is a real obliteration: because there are many other causes, particularly diseased states of the mucous membrane, from which the difficulty we encounter may proceed. That membrane may be tumefied, and thereby the caliber of the duct more or less diminished, yet the tumefaction may be capable of yielding, so that by considerable pressure we may succeed in passing the whalebone probe into the nose. Or the obstruction occasioned by the swelling of the mucous membrane may be increased by the presence of tough mucus, and then the passage of the whalebone probe becomes more difficult. In other cases, the tumefaction of the mucous membrane by which the caliber of the duct is contracted, may yield so little as to render it impossible to reach the nose with the whalebone probe. Or lastly, the mucous membrane may not only refuse to yield, but its mucous cryptae may be enlarged and indurated. In these two cases, which are much more common after fistula of the sac than along with muco-

cele, it requires great patience to pass a small silver probe through the duct.

We introduce the silver probe in the manner already described. If we cannot reach the nose with it, if its point hit constantly against the same unyeilding obstacle, if we are able to press down the probe with very considerable force without the patient complaining of any painful feeling, we have great cause to suspect an absolute obliteration of the duct. The probe being carried down to the obstacle, we lean our hand over the brow of the patient, and holding the instrument firmly between the thumb and index-finger, we increase the pressure till it has sunk to the farther depth of half a line or a line. We suddenly relax the pressure. If the probe rises from the obstacle as from an elastic cartilage, the patient during the whole of this experiment feeling no pain, we may safely conclude that the duct is obliterated. From the depth to which we can pass the probe, we ascertain the distance of the obliteration from the termination of the duct.

Though the nasal duct is only seven-twelfths of an inch in length, there are three points in its course at which stricture is particularly apt to occur. One of these is exactly where the

sac ends and the duct begins. The caliber of the duct is there narrowed by a circular fold, the thickening of which frequently causes the obstruction. Janin details the appearances upon dissection of a stricture in this situation, and describes the mucous membrane of the duct as presenting a plaited appearance like the sleeve of a shirt at the wrist.* A second fold of the same kind occurs in the middle of the duct, in many subjects, though not in all†; and hence this part becomes from a similar cause the frequent seat of stricture. The third, and perhaps the most usual situation of stricture, is at the termination of the duct in the nostril.

If we succeed, though it may not be without great difficulty and after many trials repeated during several days, in bringing one or other of the probes into the nose, which we can easily recognise by the hitting of the end of the instrument against the inferior turbinated bone or against the floor of the nostril, as well as from the feeling of the patient, we remain convinced that it is yet possible to restore the

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* Mémoires sur l'Oeil. Lyon, 1772. Page 115.

† Soemmerring—Abbildungen des Menschlichen Auges. Frankfurt am Main, 1801. Seite 32.

whole excretory apparatus of the tears to the exercise of its function.

In order to treat of the restoration of the nasal duct with precision, I shall consider three different cases. The first is when we have already passed either the whalebone or the silver probe through the duct. The second is when we do not at first succeed in passing either probe, but in which it is yet possible to pass them. The third case is when it is impossible to pass either of them through the natural caliber of the duct.

First Case.—If we have succeeded with the silver probe, we ought immediately to introduce a nail-headed silver style of the same size, and about an inch and a half long, into the duct. We now proceed progressively to restore the duct to its natural caliber. This may be done by a series of silver styles gradually increasing in thickness, or by a similar series of gum-elastic bougies. Professor Beer employs for this purpose the common catguts of the violin.

He begins with the catgut E. Having softened its point between the teeth, made seven or eight inches of it perfectly straight, and dipped it in a little oil, he introduces it first horizontally and then vertically into the sac, and

hence into the duct. He pushes it down slowly and cautiously, till five or six inches of it have descended, in order that its inferior extremity may be drawn forth by the nose without difficulty, a part of the operation which is left to the patient, even when he is a child. The superior part of the catgut is coiled up, inclosed in a piece of linen, and fastened under the hair of the forehead. Into the opening of the sac a little lint is laid, and over that a piece of court-plaster is applied.

After a couple of hours the patient tries to bring the inferior end of the catgut out of the nose, by shutting his mouth and the opposite nostril, and driving the air through the nostril into which the catgut was made to descend. The patient feels it advance, and with the blunt end of a knitting-needle, he draws it out of the nostril, turns up its extremity to the side of the nose, and fixes it there by a slip of court-plaster. All these manipulations are executed without giving the patient the smallest degree of pain. He has no other feeling than that of something disagreeably tickling.

On the following day, the lint is removed from the opening of the sac, and a quantity of one of the collyria which shall be afterwards

enumerated is injected by the side of the catgut. This injection is intended as well to wash away any mucus accumulated in the sac as to act upon the mucous membrane The superior end of the catgut is now loosened from the forehead, a sufficient fresh portion is undone from the coil, and being besmeared with one of the substances which I shall mention, is drawn into the duct by the patient, who takes hold of the extremity which hangs from the nose. The portion of catgut which had been used during the preceding day is now cut away, and the new end turned up to the side of the nose, and there fastened as before. The same injection is now repeated, the lint and plaster applied to the opening of the sac, and the coil of catgut bound up.

In this manner Professor Beer proceeds day after day till the catgut E be completely used. When it comes to an end, the patient pulls it out of the nose.

Before proceeding to pass a new catgut, the point of the syringe is to be introduced through the sac into the duct, and a quantity of tepid water, coloured with vinous tincture of opium, injected. We observe attentively whether any part of the fluid be discharged into the nose.

The catgut A is now passed as E formerly was, and its use is to be continued exactly in the same manner. When it is finished, the injection of a coloured fluid is to be repeated, in order to ascertain what progress has been made in restoring the natural diameter of the duct.

The catgut D follows. After its use, we almost constantly find that the injection no longer drops merely, as it formerly did, but wells out of the nose in a full stream. Should this not be the case after the employment of one D, this catgut must be repeated till the injection is discharged from the nose in a full stream. Then and not till then, the treatment may be brought to a close.

If the mucous membrane of the duct, when the use of the catguts is commenced, be merely somewhat tumefied, and oppose no great obstacle to the probe, the portion of catgut daily introduced is to be moistened with the vinous tincture of opium, and a quantity of the solutio lapidis divini, made lukewarm, injected by the sac. The lint, too, with which the wound of the sac is dressed, is to be dipped in the vinous tincture of opium.

If the tumefaction of the mucous membrane be

firm, so that the silver probe cannot be brought into the nose without much opposition, the catgut is to be besmeared with citrin ointment, (No. 6.) at first very much diluted, but increasing gradually in strength. The same ointment is to be applied to the wound. For an injection in the same case, the solution of corrosive sublimate given in the formulae is to be employed, together with some vinous tincture of opium.

If the cryptæ of the mucous membrane be indurated and enlarged, so that the probe is felt passing successively over a number of little knots, a weak ointment of red precipitate is to be employed for besmearing the catgut, and the patient ought daily, before the catgut is drawn, to rub in a small quantity of camphorated mercurial ointment around the opening of the sac.

Similar applications are to be used, if we prefer gum-elastic bougies or silver styles, for restoring the nasal duct to its natural caliber. Whichever of these instruments we select, we continue the employment of it for several months, and effect the wished-for restoration extremely gradually, knowing that if we remove the stricture or obstruction suddenly, it will almost to a certainty return.

When we consider ourselves warranted to discontinue the dilating instrument which we have employed, we place the patient on his back and repeat the experiment of dropping a deeply-coloured fluid into the lacus lachrymarum; for the little valvular fold which in many subjects covers the opening of the lachrymal canals into the sac,* is apt to become closed from the long-continued pressure of a foreign substance. Should the valve be shut, it must be forced open by the Anelian probe, passed through the canals.

The wound of the sac is now to be dressed once a day, with plain lint. The coloured fluid is to be daily injected. If for fourteen days successively it flows in a full stream from the nose, we proceed to close the wound. We make its edges somewhat raw with the lancet, and then bring them together with adhesive plaster.

Second Case.—As soon as we find that the silver probe sticks fast in the duct, we leave it there till the next day, fastening it to the forehead by a proper bandage, closing the opening of the sac with a little lint, and applying over

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* Rosenmueller—Partium Externarum Oculi Humani Descriptio. Lipsiae, 1810. § 125.

the lint a piece of court plaster. For a week we ought not to despair of overcoming the obstruction, not by main force, but by gentle and daily repeated endeavours to get the probe a little and a little farther through the duct, turning the instrument on its axis at every trial, and varying the direction of the pressure. If we succeed in this manner, we continue the treatment as has been explained under the first case. If we fail, this second case must be treated as the third.

Third Case.—Any mucous canal may readily come to be obliterated in one of two ways. The one is when the substance of the tube becomes violently inflamed, and consequently extremely swoln: the other, when the matter of secretion or of excretion, which in the natural state of things is constantly or frequently moving through the canal, ceases any longer to pass. When, for instance, a portion of the substance of the urethra is inflamed, its caliber becomes much contracted in consequence of the tumefaction of the parietes of the canal, and this contraction frequently remains permanent under the name of stricture, after the inflammation has subsided. There are two causes why the contraction is not so great in this case as to close the urethra completely,

namely, the considerable size of the canal, and the frequent and forcible passage of the urine. Let a small canal, such as the nasal duct, be inflamed to the same degree, and let no secreted or excreted fluid be pushed violently through it, let even the secretion or excretion, which in health slowly drops along its internal surface cease, and then it is little to be wondered at, if it come to be completely and permanently obliterated. As soon as a mucous canal ceases to be employed in the discharge of its functions, it begins to contract. If a man have a false passage from the urethra, through which the urine freely passes, three inches behind the glans penis, the three inches anterior to the false passage being no longer in use, gradually contract, and their caliber is at last entirely obliterated. If the parts have continued for several years in this state, on examining them after death we see no trace of a former canal. The application of this to the nasal duct is obvious.

I do not mean to assert, that the obliteration of the nasal duct, is, in every case, the consequence either of tumefaction of its parietes, or of contraction from disuse. When the mucous membrane of this canal becomes ulcerated or excoriated, as I have no doubt it occasionally

does in the course of inflammation, an effusion of coagulable lymph, and a consequent adhesion between the sides of the duct, may give rise to the very worst variety of obliteration.

If in our examination of the nasal duct we have discovered that part of its extent is obliterated, recourse is to be had to perforation by means of a small triangular or trocar-shaped probe. If the extent of the obliteration be inconsiderable, and consequently be placed near the opening of the duct into the nose, this perforation may be performed with confident hope of success. The sharp point of the probe is to be covered with a little bit of bees' wax, that it may not injure the duct before it reaches the obliteration. A few drops of blood flow from the nose as soon as the perforation is completed. We immediately withdraw the probe, and introduce a small silver style. This remains for a day or two, and then we commence the very gradual dilatation of the duct which has already been described.

If a considerable portion of the duct, or even its whole extent be obliterated, we ought to perform the same operation; and we do this with at least equal hopes of success as if we perforated the os unguis. It is true, that Nature,

constantly tending to destroy every thing contrary to the organic system which she has adopted, would probably close the new passage, after our dilating instruments were laid aside. This is the only case then in which the introduction of a metallic tube into the duct, to be left for life, is at all defensible. A gold or silver tube, not more than an inch in length, and presenting an elevated ring surrounding the middle of its external surface, is to be pushed down into the dilated passage which we have formed. The surrounding substance will contract upon this tube, so that it will be much less liable to be displaced, than when a similar instrument is passed into the natural caliber of the duct.*

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* See Ware's Observations on the Treatment of the Fistula Lachrymalis, London, 1818. Page 79.

FORMULÆ.

No. 1.—*Unguentum e Mercurio Præcipitato Rubro et Tutia.*

℞ Butyri recentis insulsi, ℥ß.
Mercurii præcipitati rubri, gr. x.
Tutiæ præparatæ, gr. vi. M.

No. 2.—*Solutio Lapidis Divini.*

℞ Aeruginis,
Nitri puri,
Aluminis, utriusque ℥iij.

Pulverisata liquefiant in vase vitreo in balneo arenæ. Liquefactis adde

Camphoræ tritæ, ℥iß. M.

Refrigerata massa servetur sub nomine Lapidis Divini.

℞ Lapidis Divini, gr. x—xx.
Aquæ disstillatæ ℥ß.

Solve, et cola. Colato adde

Vini Opii, ℥i—℥ii.
Aquæ Rosarum, ℥iv. M.

No. 3.—*Solutio Mercurii Sublimati Corrosivi.*

℞ Aquæ Rosarum, ℥iv.
Mercurii sublimati corrosivi, gr. ß—gr. i.
Mucilaginis purissimæ, ʒi.
Vini Opii, ♏i. M.

No. 4.—*Unguentum Janini.*

℞ Butyri recentis insulsi, ℥ß.
Mercurii pracipitati albi, gr. xv.
Boli albi, ♏i. M.

This ointment may be increased in activity by the red bole, or by the Armenian.

No. 5.—*Collyrium Acidi Nitrici.*

℞ Aquae Rosarum, ℥vi.
Acidi Nitrici, ♏i.
Alcoholis, ʒi. M.

No. 6.—*Unguentum Citrinum.*

I have long been persuaded that this ointment is improperly prepared, and that the green colour which it frequently has, arises from an excess of nitric acid. I have lately made trial of an ointment, prepared by mixing the subnitrate of mercury in powder with the common white ointment, which I find to an-

swer extremely well. The following is the method of preparing the subnitrate. To prepare a subnitrate of the red oxide of mercury, dilute some nitric acid of commerce with an equal bulk of water. Put the mixture into a capacious glass vessel near the fire, and add mercury in small portions so long as the red fumes of nitrous vapour are exhaled. When these cease, heat the solution nearly to boiling, and add a small quantity of nitric acid. This will ensure the conversion of the whole mercury into nitrate of the red oxide, and leave a small excess of nitric acid. A solution of the nitrate of the red oxide being thus obtained, it may be evaporated at a moderate heat in order to expel as much as possible of the superfluous nitric acid; but the evaporation must be stopped whenever the solution shews a tendency to deposit yellow flakes or scales. The solution in this state being added to twenty or thirty times its bulk of hot water, will deposit a fine yellow powder, which is subnitrate of the red oxide. The solution is to be added to the water, and not the water to the solution. The subnitrate is now to be separated by decantation, and washed on a filter. The decanted and filtered liquids left from the last process are to be united, and a weak solution of caustic soda or potash added gradually, taking care not to add a sufficient

quantity to precipitate the whole mercury, as hydrate of the red oxide would thus be mixed with the subnitrate. By adding the solution of potash or soda gradually, a new precipitation of suboxynitrate will be obtained, which is to be washed and dried as the former precipitate. Five grains of the powder to an ounce of white ointment, forms a citrin ointment of a beautiful yellow colour, and of the same strength as the diluted unguentum citrinum.

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